



Females Develop Less Severe Acute Pancreatitis: A Multivariate Analysis Controlled for Etiology and Core Factors

Mimi Xu, David Lehoang, Thu Mai, Jin Kim, Yousuf Kidwai, Linda Huang, Niwen Kong, Kevin Yu, Rachel Dong, Collin Mayemura, Selena Zhou, Aneesa Chowdhury, Patrick Chang, James Buxbaum
University of Southern California, Division of Gastroenterology and Liver Diseases

BACKGROUND

In gastrointestinal diseases such as alcohol-associated liver disease, gender has been shown to be an independent risk factor for severity due to differences in first-pass metabolism of alcohol, Kupffer cell activation, and hormones. We aim to describe impact of gender on the clinical course of acute pancreatitis (AP).

METHODS

We prospectively characterized a cohort of unique patients presenting between January 2015 to March 2021 with AP. Our primary outcome was the development of moderately severe or severe pancreatitis (as defined by the Revised Atlanta Classification) and our primary predictor was gender.

Linear and multivariate logistic regression analyses were performed, controlling for both patient factors (age, ethnicity, BMI) and clinical factors (etiology of AP, comorbidities, fluids administered in first 48 hours).

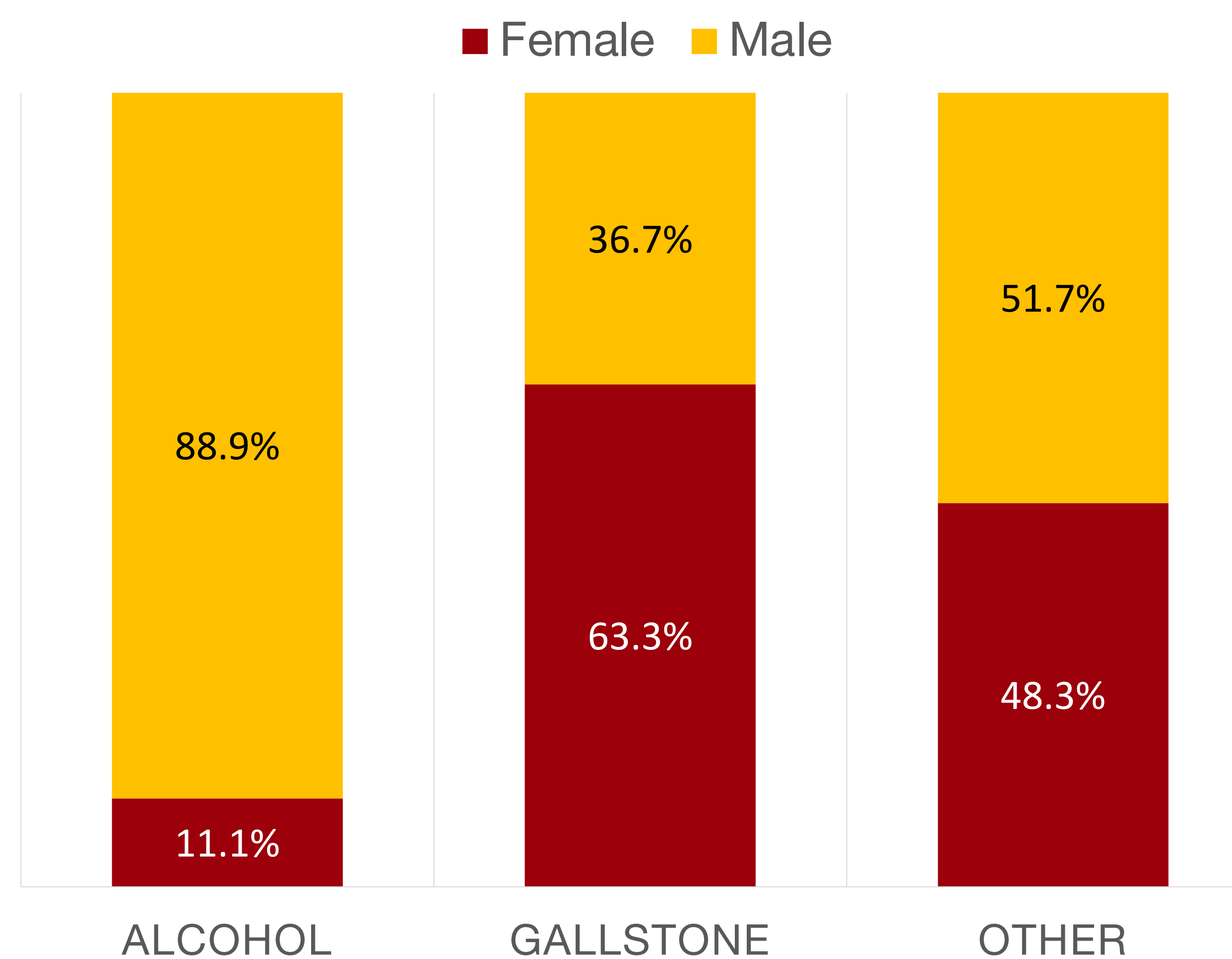
CONTACT

Mimi Xu
Resident Physician
Department of Internal Medicine
LAC+USC Medical Center
Email: mimi.xu@med.usc.edu

RESULTS

1473 patients presented with AP. Of this cohort, 45% were female, mean (SD) age was 45 (16), and 82% were Hispanic. 1179 (79.8%) patients presented with mild and 297 (20.2%) patients presented with moderately severe or severe AP. Age and fluid resuscitation did not differ between genders however females had a higher BMI (P=0.003). Males presented with alcohol AP more frequently (40.7% vs 6.1%, P<0.001), whereas females presented with gallstone AP more frequently (59.2% vs 28.6%; P<0.001). Other causes of AP were equally distributed between genders (P=0.128).

When controlled for etiology and well as age, ethnicity, BMI, comorbidities, and fluid administration, females were less likely to present with moderately severe or severe pancreatitis (OR 0.598; 95% CI 0.433-0.827). They were also less likely to develop necrotizing AP, pancreatic pseudocysts, organ failure, and require ICU level of care.



COVARIATES

COVARIATES	ALL PATIENTS N=1473	FEMALES N=669	MALES N=804	P-VALUE
Age, mean (SD)	45 (16)	45 (17)	44 (14)	P=0.308
BMI, mean (SD)	28.76 (7.14)	29.43 (7.45)	28.22 (6.84)	P=0.003
≥6L Fluids in 48 Hours	724 (49.2%)	320 (47.8%)	404 (50.2%)	P=0.356
Etiology				
Alcohol	368 (25.0%)	41 (6.1%)	327 (40.7%)	P<0.001
Gallstone	626 (42.5%)	396 (59.2%)	230 (28.6%)	P<0.001
Other	478 (32.5%)	231 (34.5%)	247 (30.7%)	P=0.493

OUTCOMES

OUTCOMES	ALL PATIENTS N=1473	FEMALES N=669	MALES N=804	OR (95% CI)
Mild Pancreatitis	1184 (80.4%)	568 (84.9%)	608 (76.6%)	1.650 (1.185-2.298)
Moderately Severe or Severe Pancreatitis	297 (20.2%)	101 (15.1%)	196 (24.4%)	0.606 (0.435-0.844)
Organ Failure	159 (10.8%)	56 (8.4%)	103 (12.8%)	0.615 (0.397-0.954)
Pancreatic Pseudocyst	35 (2.4%)	8 (1.2%)	27 (3.4%)	0.382 (0.155-0.940)
Necrotizing Pancreatitis	59 (4.0%)	9 (1.3%)	50 (6.2%)	0.244 (0.112-0.531)
Length of Stay <48 Hours	416 (28.2%)	153 (22.9%)	263 (32.7%)	0.713 (0.507-1.002)
ICU Stay	254 (17.2%)	79 (11.8%)	175 (21.8%)	0.415 (0.290-0.594)
30-Day Readmission	198 (13.4%)	81 (12.1%)	117 (14.6%)	0.994 (0.692-1.440)
Mortality	27 (1.8%)	11 (1.6%)	16 (2.0%)	1.067 (0.405-2.810)

CONCLUSIONS

Females are less likely to present with moderately severe or severe AP compared to males when controlled for etiology and core factors. This may be due to sex-specific steroid stress-responses or effects of estrogen on the pancreas. Further studies are needed to confirm these findings and elucidate the mechanism.

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